Cisco CallManager Device Mobility

The Device Mobility feature permits devices to dynamically associate with Cisco CallManager for location based information.

This chapter provides an overview of the Device Mobility feature and includes information on the following topics:

Introducing Device Mobility

Cisco CallManager uses IP subnets and device pools that contain location information to determine a device home location. By linking IP subnets to locations, the system can determine whether a device is at its home location or a remote location and register the device accordingly.

To support device mobility, modifications to the device pool structure separate the user information from the location and mobility information. The device pool now contains the information that pertains to the device itself and to device mobility. An added common profile allows you to configure all the user-related information. You must associate each device with the common profile for user based information.

In addition to the device pool and common profile, device mobility uses device mobility groups, physical locations, and device mobility information to determine device identity and roaming properties and configuration.

This section describes these topics in more detail:

- Device Pool and Common Profile
- Device Mobility Design
- Device Mobility Process

Device Pool and Common Profile

Parameters that previously were included in the device pool comprise the set of parameters that pertain to the device itself and device mobility and the set that pertain to the user.

The Device Pool window contains these parameters:

- Device Pool Name
- Cisco CallManager Group
- Date/Time Group
- Region
- SRST Reference
- Calling Search Space for Auto-registration
- Media Resource Group List

- Network Locale
- Device Mobility Group
- Location
- Physical Location
- Connection Monitor Duration
- Device Mobility Calling Search Space
- AAR Calling Search Space
- AAR Group

The Common Profile window now contains these parameters that were formerly included in the device pool:

- Common Profile Settings
  - Common Profile Name
  - Softkey Template
  - Network Hold MOH Audio Source
  - User Hold MOH Audio Source
  - User Locale
- Multilevel Precedence and Preemption (MLPP) Information
  - MLPP Indication
  - MLPP Preemption
  - MLPP Domain

Note Device pools that were already configured automatically migrate to the new structure as part of the upgrade to Cisco CallManager Release 4.2.

Device Mobility Design

To design an efficient device mobility structure, you must first determine how to divide the network into hierarchical groupings with distinct device mobility properties and make the proper associations among the groupings. This is done using device mobility groups, physical locations, device pools, and subnet-based device mobility information.

Device Mobility Groups

Device mobility groups represent the highest level geographic entities in your network. Depending upon the network size and scope, your device mobility groups could represent countries, regions, states or provinces, cities, or other entities. For example, an enterprise with a worldwide network might choose device mobility groups that represent individual countries, whereas an enterprise with a national or regional network might define device mobility groups that represent states, provinces, or cities.

Movement of a device from one device mobility group to another represents the highest level movement that Cisco CallManager recognizes.

Physical Location

Physical location represents the next division below that of device mobility group. Physical locations provide a means of distinguishing the parameters that relate to a specific geographical location from other parameters. For example, a Music on Hold (MOH) server may serve a specific office or campus within the enterprise. When a device roams to another office or campus and reregisters with Cisco CallManager, having the device served by the MOH server at the roaming location represents best practice. By defining the physical location according to availability of services such as MOH, you can assure efficient and cost-effective reassignment of services as devices move from one physical location to another. Depending upon the network structure and allocation of services, you can define physical locations based upon city, enterprise campus, or building.

Device Pools

After the device mobility groups and physical locations are identified, you can associate them with device pools. Each device pool contains the set of parameters that apply to devices, and adding the device mobility group and physical location ties the device pool to those entities.

Device Mobility Information

In the final step in designing a device mobility structure, you associate subnets with the device pools that contain the device mobility group and physical location information. When a phone registers and obtains an IP address, the system compares the address to device mobility subnets that are associated with one or more device pools. The matching subnet becomes the device home subnet for the purpose of device mobility.

Phone Configuration

After the device mobility structure is in place, you can turn device mobility on for IP phones that are provisioned to be mobile.

Device Mobility Process

This section describes how Cisco CallManager manages phone registration and assignment of parameters for device mobility.

Following initialization, the Device Mobility feature operates according to the following process:

1. A phone device record gets created for an IP phone that is provisioned to be mobile, and the phone gets assigned to a device pool. The phone registers with Cisco CallManager, and an IP address gets assigned as part of the registration process.

2. Cisco CallManager compares the IP address of the device to the subnets that are configured for device mobility in the Device Mobility Info window. The best match uses the largest number of bits in the IP subnet mask (longest match rule). For example, the IP address 9.9.8.2 matches the subnet 9.9.8.0/24 rather than the subnet 9.9.0.0/16.

3. If the device pool in the phone record matches the device pool in the matching subnet, the system considers the phone to be in its home location, and the phone retains the parameters of its home device pool.

4. If the device pool in the phone record does not match the device pools in the matching subnet, the system considers the phone to be roaming and subject to reregistration and reapplication of device parameters. Table 19-1 describes the possible conditions that can arise and the system responses.

Table 19-1   Device Mobility Conditions and Responses

Condition	System Response
The physical location of the phone's home device pool stays the same as the physical location of the device pools that are associated with the matching subnet. **Note** Although the phone may have moved from one subnet to another, the physical location and associated services have not changed.	The system does not consider the phone to be roaming, and the phone remains registered with the home device pool.
The matching subnet has a single device pool that is assigned to it; the device pool differs from the phone's home device pool, and the physical locations differ.	The system considers the phone to be roaming. It reregisters with the parameters of the device pool for the matching subnet.
The physical locations differ, and the matching subnet has multiple device pools assigned to it.	The system considers the phone to be roaming. The new device pool gets assigned according to a round-robin rule. Each time that a roaming devices comes in to be registered for the subnet, the next device pool in the set of available device pools gets assigned.
Physical location gets defined for the home device pool but is not defined for the device pools that are associated with the matching subnet	The physical location has not changed, so the phone remains registered in the home device pool.

Table 19-1   Device Mobility Conditions and Responses (continued)

Condition	System Response
Physical location that is not defined for the home device pool gets defined for the device pools that are associated with the matching subnet	The system considers the phone to be roaming to the defined physical location, and it registers with the parameters of the device pool for the matching subnet.
A subnet gets updated or removed.	The rules for roaming and assigning device pools get applied by using the remaining subnets.

5. Special conditions apply for movement within device mobility groups, as described in Table 19-2.

Table 19-2   Device Mobility Group Conditions and Responses

Condition	System Response
A device roams and reregisters with a different device pool and physical location, but within the same device mobility group.	The system considers the phone to be roaming. It reregisters with the parameters of the device pool for the matching subnet, including the Device Mobility Calling Search Space, AAR Calling Search Space, and AAR Group.

Table 19-2   Device Mobility Group Conditions and Responses (continued)

Condition	System Response
A device roams and reregisters with a different device pool and physical location in a different device mobility group.	The phone gets assigned the device pool settings of the roaming device pool; however, these device mobility parameters retain the values that are specified in the device record: • Device Mobility Calling Search Space • AAR Calling Search Space • AAR Group
A device roams, and a device mobility group does not get defined for the home or roaming device pool.	Because the phone is considered to be roaming, it gets reregistered with the parameters of the device pool for the matching subnet, including the Device Mobility Calling Search Space, AAR Calling Search Space, and AAR Group.

System Requirements for Cisco CallManager Device Mobility

Cisco CallManager Device Mobility requires the following software components to operate:

• Cisco CallManager 4.2 or later

• Microsoft Windows 2000

• Microsoft Internet Explorer or Netscape Navigator:

   Netscape 4.7 and 6.7 and Internet Explorer 5.5 and 6.

The following phones support Cisco CallManager Device Mobility:

• Cisco IP Phone 7900 series

• Cisco IP Phone Model 30 VIP

• Cisco IP Phone Model 12 SP+

• Computer Telephony Integration (CTI) Ports

- Cisco IP Communicator

Interactions and Restrictions

The Device Mobility feature depends on the IP address of the device that registers with Cisco CallManager. If the device is assigned an IP address by using NAT/PAT, the IP address that is provided during registration may not match the actual IP address of the device.

If Device Mobility Mode is set to Default in the IP Phone Configuration window, the Device Mobility Mode service parameter determines whether the device is enabled for the device mobility feature. For information on the service parameters, see the "Service Parameters Configuration" in the *Cisco CallManager Administration Guide*. For information on configuring devices, see the "Cisco IP Phone Configuration" in the *Cisco CallManager Administration Guide*.

Configuration Checklist for Device Mobility

Table 4-1 shows the steps for configuring the Cisco Device Mobility.

Figure 19-1   Cisco CallManager Device Mobility Checklist

Configuration Steps		Related Procedures and Topics
Step 1	Verify that the Cisco CallManager service is enabled in the Service Parameters window.	Service Parameters Configuration, *Cisco CallManager Administration Guide*
Step 2	Configure device mobility groups in the Device Mobility Groups window.	Device Mobility Group Configuration, *Cisco CallManager Administration Guide*
Step 3	Configure physical locations in the Physical Location window.	Physical Location Configuration, *Cisco CallManager Administration Guide*
Step 4	Configure available roaming subnets and assign device pools in the Device Mobility Info window.	Device Mobility Info Configuration, *Cisco CallManager Administration Guide*

Figure 19-1   Cisco CallManager Device Mobility Checklist (continued)

Configuration Steps		Related Procedures and Topics
Step 5	Turn the mobility mode to on for devices that will be permitted to roam.	Cisco IP Phone Configuration, *Cisco CallManager Administration Guide*
Step 6	Configure phones to use device mobility.	Cisco IP Phone Configuration, *Cisco CallManager Administration Guide*

Where to Find More Information

Related Topic

- Device Pool Configuration, *Cisco CallManager Administration Guide*

- Service Parameters Configuration, *Cisco CallManager Administration Guide*

- Physical Location Configuration, *Cisco CallManager Administration Guide*

- Device Mobility Group Configuration, *Cisco CallManager Administration Guide*

- Device Mobility Info Configuration, *Cisco CallManager Administration Guide*

- Configuring Cisco IP Phone, *Cisco CallManager Administration Guide*

- Common Profile Configuration, *Cisco CallManager Administration Guide*

Additional Cisco Documentation

- *Cisco CallManager Administration Guide*

- *Cisco CallManager System Guide*

- *Cisco CallManager Serviceability System Guide*

- *Troubleshooting Guide for Cisco CallManager*